**EX.NO:7**

**DATE:**

**IMPLEMENTATION OF PARALLEL PROGRAMMING PROGRAM**

**AIM:**

To Write a Python Programs

1. to implement data parallelism using Pool class

2. to implement the parallel program using Process class

3. to implement Synchronization between processes using Lock

4. to implement Sharing state between processes using shared memory

**ALGORITHM 1:**

* Start the program
* Import POOL
* Define FUNCTION
* Call POOL function
* Execute the program

**PROGRAM 1:**

from multiprocessing import Pool

def f(x):

return x\*x

if \_\_name\_\_ == '\_\_main\_\_':

with Pool(5) as p:

print(p.map(f, [1, 2, 3]))

**OUTPUT 1:**

[1, 4, 9]

**ALGORITHM 2:**

* Start the program
* Import PROCESS
* Define FUNCTIONS
* Print Parent class details
* Setup Threads and Start it
* Execute the program

**PROGRAM 2:**

from multiprocessing import Process

import os

def info(title):

print(title)

print('module name:', \_\_name\_\_)

print('parent process:', os.getppid())

print('process id:', os.getpid())

def f(name):

info('function f')

print('hello', name)

if \_\_name\_\_ == '\_\_main\_\_':

info('main line')

p = Process(target=f, args=('bob',))

p.start()

p.join()

**OUTPUT 2:**

main line

module name: \_\_main\_\_

parent process: 10

process id: 34

function f

module name: \_\_main\_\_

parent process: 34

process id: 58

hello bob

**ALGORITHM 3:**

* Start the program
* Import PROCESS, LOCK
* Define FUNTION
* Define Lock
* Setup Threads and Start it
* Execute the program

**PROGRAM 3:**

from multiprocessing import Process, Lock

def f(l, i):

l.acquire()

try:

print('hello world', i)

finally:

l.release()

if \_\_name\_\_ == '\_\_main\_\_':

lock = Lock()

for num in range(10):

Process(target=f, args=(lock, num)).start()

**OUTPUT 3:**

hello world 0

hello world 1

hello world 2

hello world 3

hello world 4

hello world 5

hello world 6

hello world 7

hello world 8

hello world 9

**ALGORITHM 4:**

* Start the program
* Import PROCESS , VALUE , ARRAY
* Define FUNCTION
* Define PROCESS
* Setup Threads and Start it
* Execute the program

**PROGRAM 4:**

### from multiprocessing import Process, Value, Array

### def f(n, a):

### n.value = 3.1415927

### for i in range(len(a)):

### a[i] = -a[i]

### if \_\_name\_\_ == '\_\_main\_\_':

### num = Value('d', 0.0)

### arr = Array('i', range(10))

### p = Process(target=f, args=(num, arr))

### p.start()

### p.join()

### print(num.value)

### print(arr[:])

**OUTPUT 4:**

3.1415927

[0, -1, -2, -3, -4, -5, -6, -7, -8, -9]